NOVA-7820
VIA® C3 Processor CPU Embedded Board with 10/100Mbps Ethernet, VGA, Audio
Version 1.0

Manual Version 1.1
Jul 16, 2003

©Copyright 2003 by ICP Electronics Inc. All Rights Reserved.

Copyright Notice

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer. In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.
This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Trademarks
NOVA-7820 is registered trademarks of ICP Electronics Inc., IBM PC is a registered trademark of International Business Machines Corporation. Intel is a registered trademark of Intel Corporation. Award is registered trademarks of Award Software International, Inc. Other product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

Support
Any questions regarding the content of this manual or related issues can be e-mailed to us directly at: support@iei.com.tw.

Table of Contents

1. Introduction 5
1.1 Specifications 5
1.2 Package Contents 6
2. Installation 7
2.1 NOVA-7820 Layout 7
2.2 Clear CMOS Setup 9
2.3 Compact Flash Setting 9
2.4 Audio Amplifier Select 9
2.5 LCD Panel Shift Clock/Panel VCC Select 10
2.6 COM Port RI and Voltage Selection 10
2.7 COM4 RS232/RS422(485) Selection 11
3. Connection 12
3.1 Floppy Disk Drive Connector 13
3.2 Video-in Connector 13
3.3 Ultra ATA33/66/100 IDE Disk Drive Connector 14
3.4 Parallel Port 14
3.5 USB Port Connector 15
3.6 Serial Ports 15
3.7 Power Connector 16
3.8 Keyboard Connector 17
3.9 IrDA Infrared Interface Port 17
3.10 Fan Connector 17
3.11 Audio Connectors 18
3.12 VGA Connector 18
3.13 LAN RJ45 Connector 19
3.14 Compact Flash Connector-TYPE II 19
3.15 External Switches and Indicators 20
3.16 IEEE-1394 Connector 20
3.17 CardBus/PCMCIA Connector 21
3.18 Digital I/O 22
3.19 LCD Panel Connector 23
4. AMI BIOS Setup 24
4.1 Introduction 24
4.2 Starting Setup 24
4.3 Setup Summary 24
4.4 Standard CMOS Setup Selections 26
4.5 Advanced CMOS Setup Selections 27
4.6 Advanced Chipset Setup Selections 31
4.7 Power Management Setup Selections 33
4.8 PCI / Plug and Play Setup Selections 35
4.9 Peripheral Setup Selections 37
4.10 Hardware Monitor Setup Selections 39
Appendix A Watchdog Timer 40
Appendix B Digital I/O 41
Appendix C Address Mapping 42
Appendix D How to Use Wake-up Function 44

Appendix E How to Use Video-in Function 45

Appendix F How to Use LCD-TYPE Function 47

1. Introduction

Thank you for choosing NOVA-7820 VIA® C3 Processor CPU with Multimedia & LAN Ethernet Embedded Little Board, which comes equipped with Low power VIA® C3 Processor CPU with the Intel advanced chipset 815E. This product is designed for the system manufacturers, integrators, or VARs that want to build a low power consumption system.

NOVA-7820 provides on-chip VGA which provides up to 1600 x 1200 resolution. LCD which provides up to 1024 x 768 resolution.

An advanced high performance super I/O chip – W83627 and NS87366 is used in the NOVA-7820 board. Which provide four UARTs are compatible with the NS16C550. The parallel port and FDD interface are compatible with IBM PC/AT architecture's.

The NOVA-7820 has one Fast Ethernet Multifunction PCI Controller as a LAN controller, Which are fully integrated 10BASE-T/100BASE-TX LAN solution with high performance networking functions and low power features.

This board has a built-in Compact Flash Disk Socket, CardBus, FireWire for embedded applications.

For multimedia application, NOVA-7820 provides many function, such as 1394 ,5.1 channel Audio and video in.

1.1 Specifications

- CPU: VIA® C3 Processor CPU
- DMA channels: 7
- Interrupt levels: 15
- Chipset: Intel 815E
- Memory: One 168-pin DIMM sockets. The memory capability is up to 512MB/133MHz.
- Ultra ATA/33/66/100 IDE Interface: One PCI Enhanced IDE channels (2 IDE devices). The south bridge ICH2 supports Ultra ATA/33/66/100 IDE interface. To support Ultra ATA66/100 Hard disk, a specific cable (maximum length — 45 cm) is available.
- Floppy disk drive interface: Single 2.88 MB, 1.44MB, 1.2MB, 720KB, or 360KB floppy disk drive.
- Serial ports: Four high-speed 16C550 compatible UARTs with 16-byte FIFO buffer. Up to 115 Kbps in speed. And one port supports RS232/422/485 function.
- Parallel Port: One IEEE1284 compatible Bi-directional ports. Supports SPP/ECP/EPP.
- IrDA: Supports Serial Infrared(SIR) and Amplitude Shift Keyed IR(ASKIR) interface.
- USB: Supports two USB 1.1 compatible ports.
- Audio: Onboard CMI8738 chipset, Supports 5.1 channel sound, that include LINEOUT, REAR, and CENTER/BASS.
- Watchdog timer: Software programmable — enable/disabled. Timer interval is 1 ~ 255 seconds. System Reset will be generated when time out.
- VGA Controller: Embedded VGA controller. Screen Resolution: up to

1600 x 1200 in 256 Colors at 85 Hz Refresh.

- LCD Controller: Onboard SP1015 LCD controller. Screen Resolution: up to 1024 x 768 36bits.
- Intel 82801BA embedded LAN: IEEE 802.3u Auto-Negotiation support for 10BASE-T/100BASE-TX. Fast back-to-back transmission support with minimum interframe spacing. Connected to your LAN through RJ45 connector.
- Keyboard Controller: 8042 compatible for keyboard and PS/2 mouse
- 4 Digital Inputs and 4 Digital Outputs.
- 4 Channels of composite video input.
- FireWire: TSB43AA22 provides the digital and analog transceiver functions to implement a two-port node in a cable-based IEEE 1394. Provides two P1394a fully compliant cable ports at 100/200/400 megabits per second (Mbits/s).
- CardBus: Compliant with CardBus/PCMCIA PC Card 95/97 standard specification.
- Power Consumption: 5V/3.0A and 12V/0.22A, as running by VIA Eden ESP 4000(400MHz) and 256MB SDRAM.
- Operating Temperature: 0 ℃ ~ 60 ℃ (CPU needs heatsink)

1.2 Package Contents

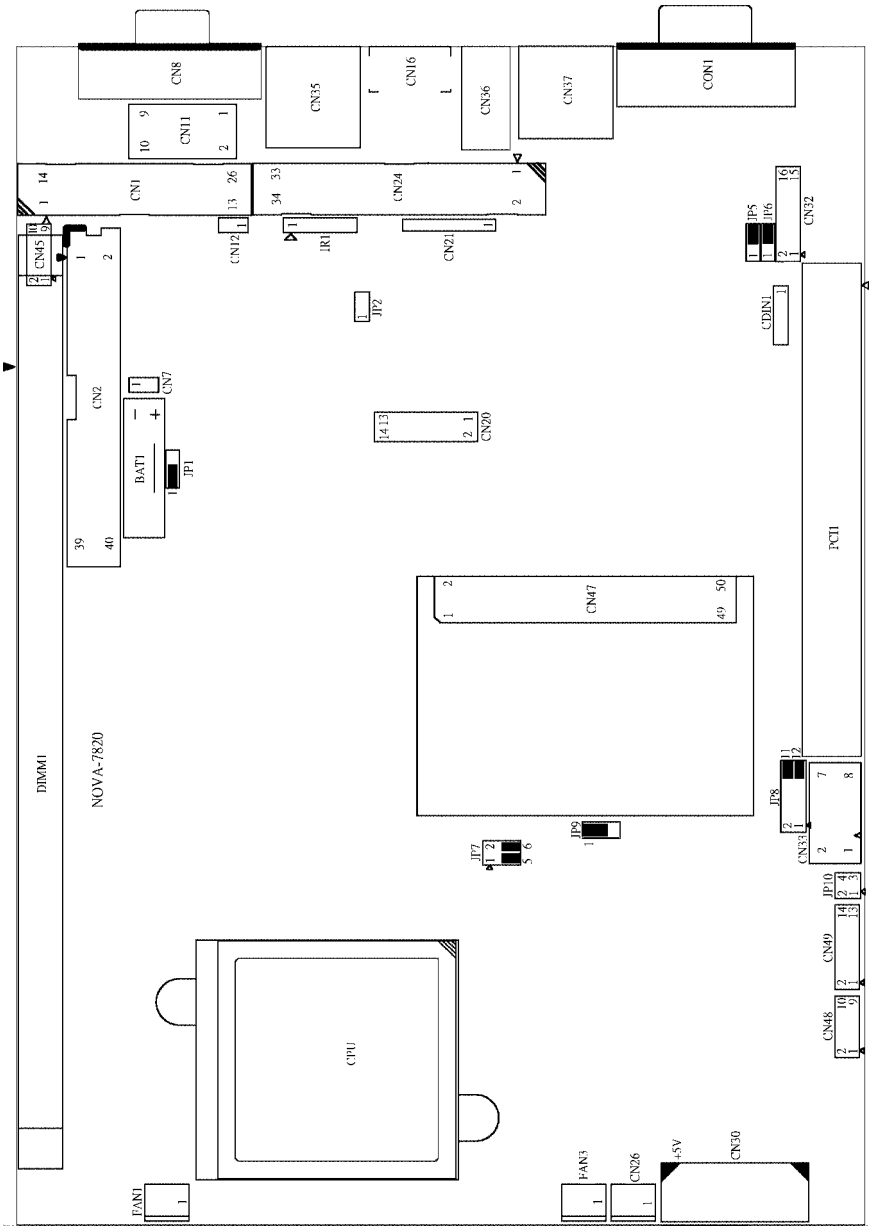
In addition to this User Manual, NOVA-7820 package includes the following items:

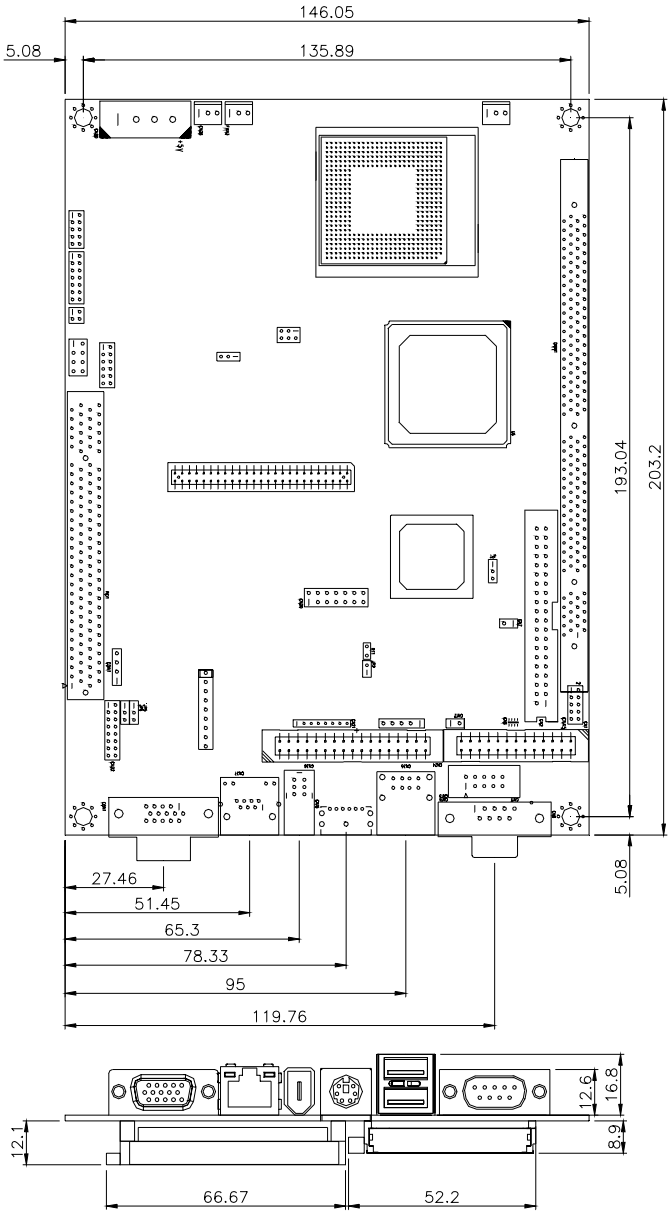
- NOVA-7820 Mobile CPU bases Single board computer x 1
- FDD cable x 1
- HDD cable x 1
- Keyboard / Mouse adapter Y cable
- Two RS-232 serial ports and RS-232/422/485 serial port cable x 1
- Printer port cable x 1
- AUDIO ports cable x 1
- 4-channel composite video cable x 2
- IEEE-1394 cable x 1

2. Installation

Follow the instructions of installing NOVA-7820. Read the unpacking information carefully before installation.

2.1 NOVA-7820 Layout




146.05
5.08
135.89
193.04
203.2
5.08
27.46
51.45
65.3
78.33
95
119.76

12.6
16.8
12.1
8.9
66.67
52.2

2.2 Clear CMOS Setup

CMOS RAM holds the configuration data of NOVA-7820, which has to be set by means of system BIOS. To clear CMOS RAM, close JP1 for about 3 seconds, and then open it again. It will then resume to normal mode.

- **JP1: Clear CMOS Setup**

JP1	Description
1-2	Keep CMOS Setup (Normal Operation)
2-3	Clear CMOS Setup

2.3 Compact Flash Setting

Set the operating mode of Compact Flash disk. This is similar to the operation of hard disk.

- **JP2: Compact Flash Setting**

JP2	Description
OPEN	**Slave**
Close	Master

2.4 Audio Amplifier Select

This jumper is for the setting of Audio Amplifier.

- **JP5: Audio L_Line out select**

JP5	Description
1-2	**OFF**
2-3	ON

- **JP6: Audio R_Line out select**

JP6	Description
1-2	**OFF**
2-3	ON

2.5 LCD Panel Shift Clock / Panel VCC Select

This jumper is for the setting of LCD panel shift clock mode and panel power voltage.

- **JP7: LCD Panel Shift Clock**

JP7	Description
1-3	Inverted
3-5	**Normal**

- **JP7: Panel VCC**

JP7	Description
2-4	+5V
4-6	**+3.3V**

2.6 COM Port RI and Voltage Selection

JP8 is setting COM3, 4 RI and Voltage.

- **JP8: Set pin 9 of COM3 as signal RI or voltage source**

JP8	Description
10-12	COM3 RI Pin Use RI
8-10	COM3 RI Pin Use Voltage

- **JP8: Set pin 9 of COM4 as signal RI or voltage source**

JP8	Description
9-11	COM4 RI Pin Use RI
7-9	COM4 RI Pin Use Voltage

- **JP8: Set pin 9 of COM3 as +5V or 12V**

JP8	Description
2-4	COM3 RI Pin Use Voltage +5V
4-6	COM3 RI Pin Use Voltage +12V

- **JP8: Set pin 9 of COM4 as +5V or 12V**

JP8	Description
1-3	COM4 RI Pin Use Voltage +5V
3-5	COM4 RI Pin Use Voltage +12V

2.7 COM4 RS232/RS422(485) Selection

- **JP9: Selection COM4 is RS232/RS422(485)**

JP9	Description
1-2	RS232
2-3	RS422/485

- **JP10: Selection COM4 is RS422/RS485**

	Description	
JP10	1-3	2-4
RS422	**OFF**	**OFF**
RS485	ON	ON

3. Connection

This chapter describes how to connect peripherals, switches and indicators to the NOVA-7820 board. The following table lists the connectors on NOVA-7820.

Label	Description
CDIN1	CD-IN Connector
CN1	Parallel Port Connector
CN2	IDE Connector
CN7	SUS LED
CN8,11	Serial Port 1,2
CN12	ATX Power On/Off Button Connector
CN16	DIN Connector for Keyboard/Mouse
CN20	External Switch and Indicators
CN21,36	IEEE-1394 Connector
CN24	FDD Connector
CN26	ATX Power Connector
CN30	Power Connector
CN32	Audio Connector
CN33	4 Channels of composite video in Connector
CN35	USB Connector
CN37	LAN Connector
CN43	Compact Flash
CN44	CardBus/PCMCIA Connector
CN45	Digital I/O
CN47	LCD Connector
CN48,49	Serial Port 3,4
CON1	VGA Connector
FAN1,3	Fan Connectors
IR1	IrDA Connector
PCI1	Specific PCI Slot

3.1 Floppy Disk Drive Connector

NOVA-7820 board is equipped with a 34-pin daisy-chain driver connector cable.

- **CN24: FDD Connector**

PIN	Description	PIN	Description
1	GROUND	2	REDUCE WRITE
3	GROUND	4	N/C
5	GROUND	6	DS1#
7	GROUND	8	INDEX#
9	GROUND	10	MOTOR ENABLE A#
11	GROUND	12	DRIVE SELECT B#
13	GROUND	14	DRIVE SELECT A#
15	GROUND	16	MOTOR ENABLE B#
17	GROUND	18	DIRECTION#
19	GROUND	20	STEP#
21	GROUND	22	WRITE DATA#
23	GROUND	24	WRITE GATE#
25	GROUND	26	TRACK 0#
27	GROUND	28	WRITE PROTECT#
29	N/C	30	READ DATA#
31	GROUND	32	SIDE 1 SELECT#
33	N/C	34	DISK CHANGE#

3.2 Video-in Connector

NOVA-7820 is equipped witch 4 channels of composite video connector(BT878A).

- **CN33: Capture IN**

PIN	Description	PIN	Description
1	AVIN0	2	GROUND
3	AVIN1	4	GROUND
5	AVIN2	6	GROUND
7	AVIN3	8	GROUND

3.3 Ultra ATA33/66/100 IDE Disk Drive Connector

You can attach one IDE (Integrated Device Electronics) hard disk drives to the NOVA-7820 IDE controller.

- **CN2: Primary IDE Connector**

PIN	Description	PIN	Description
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	N/C	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	CHRDY	28	GROUND
29	DACK	30	GROUND
31	INTERRUPT	32	GROUND
33	SA1	34	P66DET
35	SA0	36	N/C
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

3.4 Parallel Port

This port is usually connected to a printer. NOVA-7820 includes an on-board parallel port, and accessed through a 26-pin flat-cable connector CN1. Three modes: SPP, EPP and ECP are supported.

- **CN1: Parallel Port Connector**

PIN	Description	PIN	Description
1	STROBE#	14	AUTO FORM FEED #
2	DATA 0	15	ERROR#
3	DATA 1	16	INITIALIZE
4	DATA 2	17	PRINTER SELECT LN#
5	DATA 3	18	GROUND
6	DATA 4	19	GROUND
7	DATA 5	20	GROUND
8	DATA 6	21	GROUND
9	DATA 7	22	GROUND
10	ACKNOWLEDGE	23	GROUND
11	BUSY	24	GROUND
12	PAPER EMPTY	25	GROUND
13	PRINTER SELECT	26	N/C

3.5 USB Port Connector

NOVA-7820 provides two USB ports (USB 1.1 compliant).

- **CN35: USB 8-PIN HEADER**

PIN	Description
A1	VCC
A2	DATA0-
A3	DATA0+
A4	GROUND
B1	VCC
B2	DATA0-
B3	DATA0+
B4	GROUND

3.6 Serial Ports

NOVA-7820 offers four high speed NS16C550 compatible UARTs with Read/Receive 16 byte FIFO in each serial port.

- **CN8: D_SUB 9-PIN Connector**

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)

- **CN11: 10-pin Connector**

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)
10	N/C

- **CN48: 10-pin Connector**

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)
10	N/C

- **CN49: 14-pin Connector**

PIN	Description
1	DATA CARRIER DETECT (DCD)
2	RECEIVE DATA (RXD)
3	TRANSMIT DATA (TXD)
4	DATA TERMINAL READY (DTR)
5	GROUND
6	DATA SET READY (DSR)
7	REQUEST TO SEND (RTS)
8	CLEAR TO SEND (CTS)
9	RING INDICATOR (RI)
10	N/C
11	TX+ (RS422/485)
12	TX- (RS422/485)
13	RX+ (RS422/485)
14	RX- (RS422/485)

3.7 Power Connector

NOVA-7820 has one power connector for power supply.

- **CN30: Power Supply Connector**

PIN	Description
1	VCC12V
2	GROUND
3	GROUND
4	VCC5V

- **CN26: ATX Power Connector**

PIN	Description
1	VCC5VSB
2	PS_ON
3	GROUND

3.8 Keyboard Connector

NOVA-7820 provides 6-PIN MIN-DIN keyboard/mouse connector.

- **CN16: 6-pin Mini-DIN Keyboard/Mouse Connector**

PIN	Description
1	KEYBOARD DATA
2	MOUSE DATA
3	GROUND
4	+5V
5	KEYBOARD CLOCK
6	MOUSE CLOCK

3.9 IrDA Infrared Interface Port

NOVA-7820 has a built-in IrDA port which supports Serial Infrared (SIR) or Amplitude Shift Keyed IR (ASKIR) interface. To use the IrDA port, set SIR or ASKIR model in COM 2 of BIOS Peripheral Setup. Then the normal RS-232 COM 2 will be disabled.

- **IR1: IrDA Connector**

PIN	Description
1	VCC5V
2	N/C
3	IR-RX
4	GROUND
5	IR-TX

3.10 Fan Connector

NOVA-7820 provides CPU cooling fan connector and system fan connector. CPU connectors can supply 12V/500mA. The Fan's rotation is in full speed.

- **FAN1, FAN3: Fan Connector**

PIN	Description
1	SENSOR
2	12V
3	GROUND

3.11 Audio Connectors

NOVA-7820 has a built-in AUDIO chipset (CMEDIA CMI8738LX); connector directly connects to the pin-header (CN32). The audio chipset can support 5.1 channel sounds that include LINE-OUT, REAR, and CENTER/BASS.

- **CN32: Audio Connector (2x8_2.00mm)**

PIN	Description	PIN	Description
1	LINEOUT_L	2	GROUND
3	LINEOUT_R	4	GROUND
5	CENTER	6	BASS
7	GROUND	8	GROUND
9	LININ_L	10	LINEIN_R
11	GROUND	12	GROUND
13	REAR_L	14	REAR_R
15	MIN_IN	16	GROUND

- **CDIN1: CD-IN**

PIN	Description
1	CD LEFT SIGNAL
2	GROUND
3	GROUND
4	CD RIGHT SIGNAL

3.12 VGA Connector

NOVA-7820 has a built-in 15-pin VGA connector directly to your CRT monitor.

- **CON1: 15-pin Female Connector**

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GROUND	6	GROUND
7	GROUND	8	GROUND
9	VCC	10	GROUND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

3.13 LAN RJ45 Connector

NOVA-7820 is equipped with built-in one 10/100Mbps Ethernet Controller. You can connect it to your LAN through RJ45 LAN connector. The pin assignments are as following:

- **CN37 : Intel 82562ET LAN RJ45 Connector**

PIN	Description	PIN	Description
1	TX+	5	N/C
2	TX-	6	RX-
3	RX+	7	N/C
4	N/C	8	N/C

3.14 Compact Flash Connector-TYPE II

NOVA-7820 supports one Compact Flash socket that be provided from IDE2. You must set the jumper to avoid the conflict.

- **CN43: Compact Flash Socket**

PIN	Description	PIN	Description
1	GROUND	26	VCC-IN CHECK2
2	DATA3	27	DATA11
3	DATA4	28	DATA12
4	DATA5	29	DATA13
5	DATA6	30	DATA14
6	DATA7	31	DATA15
7	HDC_CS0#	32	HDC_CS1#
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	N/C
12	N/C	37	INTERRUPT
13	+5V	38	+5V
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	RESET#
17	N/C	42	IORDY
18	SA2	43	N/C
19	SA1	44	+5V
20	SA0	45	HDD_ACTIVE#
21	DATA0	46	N/C
22	DATA1	47	DATA8
23	DATA2	48	DATA9
24	N/C	49	DATA10
25	VCC-IN CHECK2	50	GROUND

3.15 External Switches and Indicators

There are several external switches and indicators for monitoring and controlling your CPU board. All the functions are in the CN7, CN12, and CN20 connectors.

- **Suspend Led Connector (CN7)**

PIN	Description
1	LED+
2	LED-

- **ATX Power On/Off Button Connector (CN12)**

PIN	Description
1	PWR_BUTTON+
2	GROUND

- **CN20: Multi Panel**

PIN	Description	PIN	Description
1	POWER-LED +	2	SPEAKER -
3	N/C	4	N/C
5	POWER-LED -	6	N/C
7	KEYLOCK+	8	SPEAKER +5V
9	KEYLOCK-	10	RESET SW
11	GROUND	12	RESET SW GND
13	HDD LED+	14	HDD LED -

3.16 IEEE-1394 Connector

NOVA-7820 is equipped witch IEEE1394 controller (TI TSB43AA22). You can connect it to your 1394 device through CN21, 36 connectors. The pin assignments are as follows:

- **CN21: 1394 Connector**

PIN	Description	PIN	Description
1	VCC12V	2	GROUND
3	TPB-	4	TPB+
5	TPA-	6	TPA+
7	NC/FG	8	NC/FG

- **CN36: 1394 Connector**

PIN	Description	PIN	Description
1	VCC12V	2	GROUND
3	TPB-	4	TPB+
5	TPA-	6	TPA+

3.17 CardBus/PCMCIA Connector

NOVA-7820 built-in a CardBus/PCMCIA interface connector.

- **CN44: CardBus/PCMCIA Connector**

PIN	Description	PIN	Description
1	GROUND	2	D3
3	D4	4	D5
5	D6	6	D7
7	CE1#	8	A10
9	OE#	10	A11
11	A9	12	A8
13	A13	14	A14
15	WE#	16	READY
17	VCC	18	VCC
19	A16	20	A15
21	A12	22	A7
23	A6	24	A5
25	A4	26	A3
27	A2	28	A1
29	A0	30	D0
31	D1	32	D2
33	WP	34	GROUND
35	GROUND	36	CD1#
37	D11	38	D12
39	D13	40	D14
41	D15	42	CE2#
43	VS1#	44	IORD#
45	IOWR#	46	A17
47	A18	48	A19
49	A20	50	A21
51	VCC	52	VCC
53	A22	54	A23
55	A24	56	A25
57	VS2#	58	RESET
59	WAIT#	60	INPACK#
61	REG#	62	BVD2
63	BVD1	64	D8
65	D9	66	D10
67	CD2#	68	GROUND
69	GROUND	70	GROUND

3.18 Digital I/O

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on NOVA-7820.

Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices. We provide "BIOS Call" for DIO reading.

READ		WRITE	
Bit0	DIN0	Bit0	DO0
Bit1	DIN1	Bit1	DO1
Bit2	DIN2	Bit2	DO2
Bit3	DIN3	Bit3	DO3

- **CN45: Digital I/O**

PIN	Description	PIN	Description
1	GROUND	2	VCC5V
3	DO3	4	DO2
5	DO1	6	DO0
7	DIN3	8	DIN2
9	DIN1	10	DIN0

3.19 LCD Panel Connector

NOVA-7820 provides a 2 x 25-pin connector for the LCD flat panel interface. NOVA-7820 supports TFT LCD panels at following display options:

Video Display Type	Resolution	Example
TFT VGA	640 x 480, 18 bits	Toshiba LTM10C209H
TFT SVGA	800 x 600, 18 bits	Toshiba LTM12C275C
TFT XVGA	1024 x 768, 18 bits	L.G LM151X2

Note that the table is for reference only. The LCD panel connector of NOVA-7820 may support more panel types.

- **CN47: LCD Panel Connector for SP1015**

PIN	Description	PIN	Description
1	N/C	2	RB2
3	BB2	4	RB3
5	BB3	6	RB4
7	BB4	8	RB5
9	BB5	10	RB6
11	BB6	12	RB7
13	BB7	14	RA5
15	RA7	16	RA6
17	GB2	18	RA4
19	GB3	20	RA2
21	RA3	22	GA6
23	GA5	24	GA4
25	GA7	26	GA3
27	BA7	28	GA2
29	Panel-VCC	30	Panel-VCC
31	GB4	32	GB5
33	BA4	34	BA6
35	BA3	36	BA5
37	BA2	38	GB6
39	RM	40	GB7
41	Shift Clock	42	Enable Backlight
43	FPVDD	44	FLM
45	Enable VEE	46	LP
47	GND	48	GND
49	Inverter VCC	50	Inverter VCC

4. AMI BIOS Setup

4.1 Introduction

This chapter discusses the Setup program built into the BIOS. which allows users to configure the system. This configuration is then stored in battery-backed CMOS RAM so that Setup information is retained whilst the power is off.

4.2 Starting Setup

The BIOS is immediately active when you turn on the computer. While the BIOS is activated, the Setup program can be entered in one of two ways: By pressing <Del> immediately after switching the system on, or by pressing the <Del> key when the following message appears briefly at the bottom of the screen during the POST (Power On Self-Test).

Press DEL to run SETUP.

4.3 Setup Summary

Standard CMOS Setup:
Standard CMOS Setup to change time, date, hard disk type, etc.

Advanced CMOS Setup:
Advanced CMOS Setup to configure system options.

Advanced Chipset Setup:
Advanced Chipset Setup to configure chipset features.

Power Management Setup:
Power Management Setup to configure power management features.

PCI / Plug and Play Setup:
Configures PCI / Plug and Play features.

Peripheral Setup:
Configures peripheral features.

Hardware Monitor Setup:
Configures hardware monitor features.

Auto-Detect Hard Disks:
Selecting these options allow the user to configure the drive named in the option. Select Auto-Detect Hard Disks to allow AMIBIOS to automatically configure the drive. A list of drive parameters will appear on the screen.

Change User Password:
Change the user password.

Change Supervisor Password:
Change the supervisor password.

Auto Configuration with Optimal Settings:
Load configuration settings that ensure the highest performance.

Auto Configuration with Fail Safe Settings:
Load fails-safe configuration settings.

Save Settings and Exit:
Write the current settings to CMOS and exit.

Exit Without Saving:
Exit without saving the current settings.

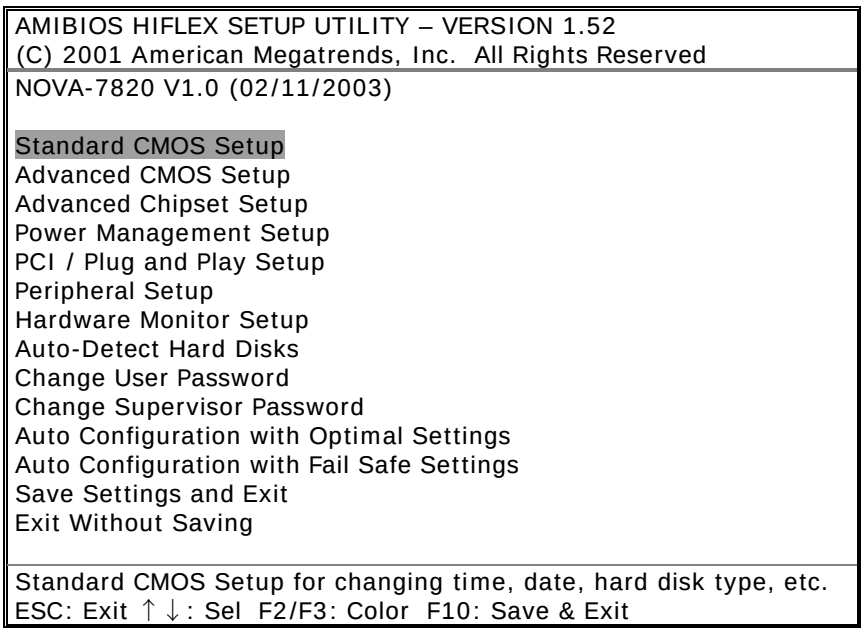

AMIBIOS HIFLEX SETUP UTILITY – VERSION 1.52
(C) 2001 American Megatrends, Inc. All Rights Reserved
NOVA-7820 V1.0 (02/11/2003)
Standard CMOS Setup
Advanced CMOS Setup
Advanced Chipset Setup
Power Management Setup
PCI / Plug and Play Setup
Peripheral Setup
Hardware Monitor Setup
Auto-Detect Hard Disks
Change User Password
Change Supervisor Password
Auto Configuration with Optimal Settings
Auto Configuration with Fail Safe Settings
Save Settings and Exit
Exit Without Saving
Standard CMOS Setup for changing time, date, hard disk type, etc.
ESC: Exit ↑ ↓: Sel F2/F3: Color F10: Save & Exit

Figure 1: Main Menu

4.4 Standard CMOS Setup Selections

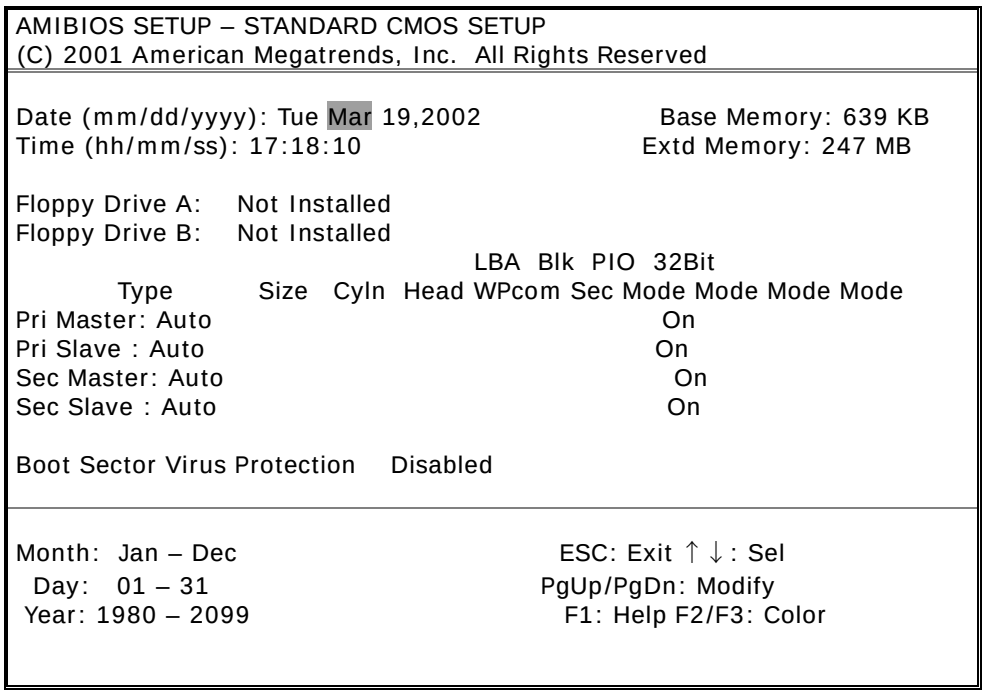

AMIBIOS SETUP – STANDARD CMOS SETUP
(C) 2001 American Megatrends, Inc. All Rights Reserved
Date (mm/dd/yyyy): Tue Mar 19,2002
Base Memory: 639 KB
Time (hh/mm/ss): 17:18:10
Extd Memory: 247 MB
Floppy Drive A: Not Installed
Floppy Drive B: Not Installed
LBA Blk PIO 32Bit
Type Size Cyln Head WPcom Sec Mode Mode Mode Mode
Pri Master: Auto On
Pri Slave : Auto On
Sec Master: Auto On
Sec Slave : Auto On
Boot Sector Virus Protection Disabled
Month: Jan – Dec
ESC: Exit ↑ ↓ : Sel
Day: 01 – 31
PgUp/PgDn: Modify
Year: 1980 – 2099
F1: Help F2/F3: Color

Figure 2: Standard CMOS Setup

Date (mm/dd/yyyy)
Set the system date.

Time (hh/mm/ss)
Set the system time.

Floppy A, B
Move the cursor to these fields and select the floppy type.

Primary/Secondary Master/Slave LBA Mode
LBA (Logical Block Addressing) is a new IDE HDD access method to develop to overcome the 528-megabyte capacity bottleneck. If your IDE hard disk capacity is greater than 528MB, AMIBIOS can enable this LBA mode feature. The option is only for Primary Master IDE LBA mode.

Primary/Secondary Master/Slave Block Mode
If your hard disk drive supports IDE block transfer mode, enable this option for a faster IDE hard disk drive transfer rate. The option is only for Primary Master Block mode.

Primary/Secondary Master/Slave PIO Mode
This option enables Primary Master IDE PIO mode on the IDE, which can set proper cycle timings. The cycle timing between the IDE PIO mode value and IDE cycle timing is shown below :
Mode 0 -> Timing (600ns)Mode 1 -> Timing (383ns)
Mode 2 -> Timing (240ns)Mode 3 -> Timing (180ns)
Mode 4 -> Timing (120ns)Mode 5 -> Timing (60ns)

Primary/Secondary Master/Slave 32Bit Mode
This option enables Primary Master IDE 32-bit data transfers on the IDE data port. If disabled,16-bit data transfer is used by the BIOS.32-bit data transfers can only be enabled if IDE prefetch mode is also enabled.

Boot Sector Virus Protection
When this option is enabled, AMIBIOS issues a warning when any program or virus issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The settings are Disabled, or Enabled.

Base/Extd Memory
Displays the amount of conventional/extended memory detected during boot up.

4.5 Advanced CMOS Setup Selections

AMIBIOS SETUP – ADVANCED CMOS SETUP
(C) 2001 American Megatrends, Inc. All Rights Reserved

Quick Boot	Enabled	Available Options:
1st Boot Device	Disabled	Disabled
2nt Boot Device	Disabled	> Enabled
3rd Boot Device	Disabled	
Try Other Boot Devices	Yes	
LAN Boot ROM	Disabled	
Floppy Access Control	Read-Write	
Hard Disk Access Control	Read-Write	
S.M.A.R.T. for Hard Disks	Disabled	
BootUP Num-Lock	On	
Floppy Drive Seek	Disabled	
PS/2 Mouse Support	Enabled	
System Keyboard	Present	
Primary Display	VGA/EGA	
Password Check	Setup	
Boot To OS/2	No	
Wait For 'F1' If Error	Enabled	
Hit 'DEL' Message Display	Enabled	
L1 Cache	WriteBack	
L2 Cache	WriteBack	
System BIOS Cacheabled	Disable	
C000 16K Shadow	Enabled	
C400 16K Shadow	Enabled	
C800 16K Shadow	Enabled	ESC: Exit ↑ ↓: Sel
CC00 16K Shadow	Disabled	PgUp/PgDn: Modify
D000 16K Shadow	Disabled	F1: Help F2/F3: Color
D400 16K Shadow	Disabled	
D800 16K Shadow	Disabled	
DC00 16K Shadow	Disabled	

Figure 3: Advanced CMOS Setup

Quick Boot
When Quick Boot is selected, DRAM testing function will be disabled.

1st Boot Device
This option sets the type of device for the first boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, CDROM, and SCSI.

2nd Boot Device
This option sets the type of device for the second boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, and CDROM.

3rd Boot Device
This option sets the type of device for the third boot drives that the AMIBIOS attempts to boot from after AMIBIOS POST completes. The settings are Disabled, IDE-0, IDE-1, IDE-2, IDE-3, Floppy, ARMD-FDD, ARMD-HDD, and CDROM.

Try Other Boot Devices
Set this option to Yes to instruct AMIBIOS to attempt to boot from any other drive in the system if it cannot find a boot drive among the drives specified in the 1st Boot Device, 2nd Boot Device, 3rd Boot Device, 4th Boot Device options. The settings are Yes or No.

Floppy Access Control
This option specifies the read/write access that is set when booting from a floppy drive.

Hard Disk Access Control
This option specifies the read/write access that is set when booting from a hard disk drive.

S.M.A.R.T. for Hard Disks
Self-Monitoring, Analysis and Reporting Technology. This option can help the BIOS to warn the user of a possible device failure and give the user a chance to back up the device before the failure actually happens. The settings are Auto, Disabled, Enabled.

Floppy Drive Seek
Set this option to Enabled to specify that floppy drive A: will perform a Seek operation at system boot. The settings are Enabled or Disabled.

BootUp Num-Lock
When this option is selected, Num Lock is turned off when the system is powered on so the user can use the arrow keys on both the numeric keypad and the keyboard.

PS/2 Mouse Support
When this option is enabled, BIOS supports a PS/2- type mouse.

System Keyboard
This option does not specify if a keyboard is attached to the computer. Rather, it specifies if error messages are displayed if a keyboard is not attached. This option permits you to configure workstation with no

keyboard. The settings are Absent, Present.

Primary Display
Select this option to configure the type of monitor attached to the computer. The settings are Monochrome, Color 40x25, Color 80x25, VGA/PGA/EGA, or Not Install.

Password Check
This item allows you Setup/Always Password Check.

Boot To OS/2
Set this option to Enabled if running OS/2 operating system and using more than 64MB of system memory on the motherboard. The settings are Disabled or Enabled.

Wait For 'F1' If Error
If this option is enabled, AMIBIOS waits for the end user to press <F1> before continuing. If this option is disabled, AMIBIOS continues the boot process without waiting for <F1> to be pressed. The settings are Disabled or Enabled.

Hit 'DEL' Message Display
Disabling this option prevents "Hit <DEL> if you want to run Setup" from appearing when the system boots. The settings are Disabled or Enabled**.**

L1 Cache
The options include Disable/WriteThru/WriteBack the internal cache memory in the processor.

L2 Cache
The options include Disable/WriteThru/WriteBack the secondary cache memory.

System BIOS Cacheable
When this option is set to Enabled, the System ROM area from F0000-FFFFF is copied (shadowed) to the RAM for faster execution.

C000, 16k Shadow
When this option is set to Enabled, the Video ROM area from C0000-C3FFF is copied (shadowed) to the RAM for faster execution.
Disabled: The contents of the video ROM are not copied to the RAM.
Cached: The contents of the video ROM area from C0000h - C3FFFh are copied from the ROM to the RAM and can be written to or read from the cache memory.
Enabled: The contents of the video ROM area from C0000h - C3FFFh are copied (shadowed) from the ROM to the RAM for faster execution.

C400, 16k Shadow
When this option is set to Enabled, the Video ROM area from C4000-C7FFF is copied (shadowed) to the RAM for faster execution.
Disabled: The contents of the video ROM are not copied to the RAM.
Cached: The contents of the video ROM area from C4000h - C7FFFh are copied from the ROM to the RAM and can be written to or read from the cache memory.
Enabled: The contents of the video ROM area from C4000h - C7FFFh are copied (shadowed) from the ROM to the RAM for faster execution.

C800, 16k Shadow
These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enabled, Disabled, and Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

CC00, 16k Shadow
These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enabled, Disabled, and Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

D000, 16k Shadow
These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enabled, Disabled, and Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

D400, 16k Shadow
These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

D800, 16k Shadow
These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

DC00, 16k Shadow
These options enable shadowing of the contents of the ROM area named in the option title. The settings are Enable Disable, Cached. The ROM area that is not used by ISA adapter cards will be allocated to PCI adapter cards.

4.6 Advanced Chipset Setup Selections

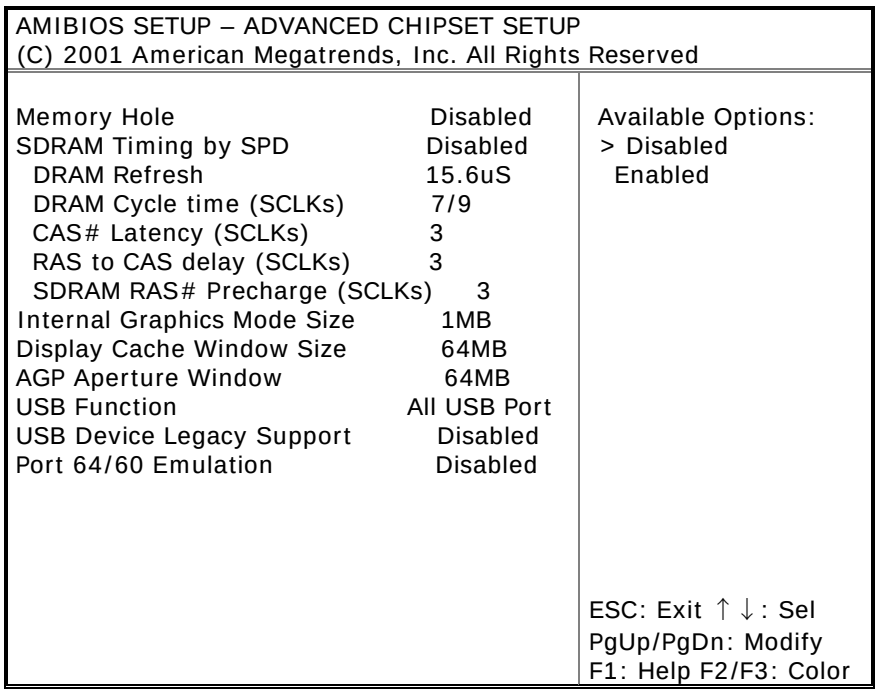

AMIBIOS SETUP – ADVANCED CHIPSET SETUP
(C) 2001 American Megatrends, Inc. All Rights Reserved
Memory Hole Disabled
SDRAM Timing by SPD Disabled
DRAM Refresh 15.6uS
DRAM Cycle time (SCLKs) 7/9
CAS# Latency (SCLKs) 3
RAS to CAS delay (SCLKs) 3
SDRAM RAS# Precharge (SCLKs) 3
Internal Graphics Mode Size 1MB
Display Cache Window Size 64MB
AGP Aperture Window 64MB
USB Function All USB Port
USB Device Legacy Support Disabled
Port 64/60 Emulation Disabled
Available Options:
> Disabled
Enabled
ESC: Exit ↑ ↓: Sel
PgUp/PgDn: Modify
F1: Help F2/F3: Color

Figure 4: Advanced Chipset Setup

Memory Hold
This field allows you to reserve an address space for ISA devices that require it. Configuration options: [Disabled] [15MB-16MB]

SDRAM Timing by SPD
This sets the optimal timings for items "DRAM Refresh", "DRAM Cycle time", "CAS# Latency", "RAS to CAS delay" and "SDRAM RAS# Precharge", depending on the memory modules that you are using.

DRAM Cycle time (SCLKs)
This feature controls the number of SDRAM clocks used for SDRAM parameters Tras and Trc. Tras specifies the minimum clocks required between active command and precharge command. Trc specifies the minimum clocks required between active command and re-active command.

CAS# Latency (SCLs)
This controls the latency between the SDRAM read command and the time that the data actually becomes available.

RAS to CAS Delay (SCLKs)
This controls the latency between the SDRAM active command and the read/write command.

SDRAM RAS# Precharge (SCLKs)
This controls the idle clocks after issuing a precharge command to the SDRAM.

Display Cache Window Size
This feature allows you to select the size of mapped memory for Display Cache data.

AGP Aperture Window
This feature allows you to select the size of mapped memory for AGP graphic data.

USB Function
Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals.

USB Device Legacy Support
This motherboard support Universal Serial Bus (USB) devices. If detected, USB controller legacy mode will be enabled. If not detected, USB controller legacy mode will be disabled.

4.7 Power Management Setup Selections

AMIBIOS SETUP – POWER MANAGEMENT SETUP (C) 2001 American Megatrends, Inc. All Rights Reserved		
ACPI Aware O/S	No	Available Options:
Sleep State	S1/POS	> No
USB KB/MS wakeup From S3	Disable	Yes
Power Management/APM	Enabled	
Suspend Time Out	Disabled	
Throttle Slow Clock Temperature	65℃/149℉	
Throttle Slow Clock Ratio	50.0%	
Keyboard & PS/2 Mouse	Monitor	
FDC/LPT/COM Ports	Monitor	
SB & MSS Audio Ports	Ignore	
MIDI Ports	Ignore	
ADLIB Ports	Ignore	
Primary Master IDE	Monitor	
Primary Slave IDE	Ignore	
Secondary Master IDE	Monitor	
Secondary Slave IDE	Ignore	
System Thermal	Ignore	
Power Button Function	ON/Off	ESC: Exit ↑ ↓ : Sel
Restore on AC/Power Loss	Last State	PgUp/PgDn: Modify
Wake Up On Ring	Disabled	F1: Help F2/F3: Color
Wake Up On Lan	Disabled	
Wake Up On PME	Disabled	
Resume By Alarm	Disabled	
Alarm Date	15	
Alarm Hour	12	
Alarm Minute	30	
Alarm Second	30	
Power Type Select	AT	

Figure 5: Power Management Setup

ACPI Aware O/S
This feature is switch of ACPI function.

Sleep State
This feature is switch of STR (S3) or POS (S1) function.

USB KB/MS wakeup From S3
This option set to "Enabled", using USB keyboard or USB mouse can wake up system, when system entry to S3 mode.

Power Management/APM
Set this option to Enabled to run APM (Advanced Power Management).

Suspend Time Out
This option specifies the length of a period of system inactivity while in Standby state. When this length of time expires, the computer enters Suspend power state.

Keyboard & PS/2 Mouse
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal mode.

FDC/LPT/COM Ports
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

SB & MSS Audio Ports
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

MIDI Ports
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

ADLIB Ports
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

Primary Master IDE
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

Primary Slave IDE
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

Secondary Master IDE
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

Secondary Slave IDE
Enabling the option allows the IRQ input to be monitored for both inactivating for entering Auto_mode/SMI_mode and activating for entering Normal_mode.

Power Button Function
This option specifies how the power button mounted externally on the computer chassis is used.

Wake Up On Ring
Ring Resume From Soft Off

Wake Up On Lan
LAN Resume From Soft Off

Wake Up On PME
PME# Resume From Soft Off

Resume By Alarm
When this option is set enabled, system will according to you set time then wakeup from soft off mode.

Alarm Date
You can set time for date.

Alarm Hour
You can set time for hour.

Alarm Minute
You can set time for minute.

Alarm Second
You can set time for second.

Power Type Select
Select you use power type.

4.8 PCI / Plug and Play Setup Selections

AMIBIOS SETUP – PCI / PLUG AND PLAY SETUP (C)2001 American Megatrends, Inc. All Rights Reserved		
Plug and Play Aware O/S	No	Available Options:
Clear NVRAM on Every Boot	No	No
On Board Audio Controller	Enabled	> Yes
On Board IEEEE1394 Controller	Enabled	
On Board PCMCIA Controller	Enabled	
PCI Latency Timer (PCI Clocks)	64	
Primary Graphics Adapter	External PCI	
PCI VGA Palette Snoop er	Disabled	
Allocate IRQ to PCI VGA	No	
OffBoard PCI IDE Card	Auto	
OffBoard PCI IDE Primary IRQ	Disabled	
OffBoard PCI IDE Secondary IRQ	Disabled	
PCI Slot1 IRQ Priority	Auto	
PCI Slot2 IRQ Priority	Auto	
PCI Slot3 IRQ Priority	Auto	
PCI Slot4 IRQ Priority	Auto	
DMA Channel 0	PnP	
DMA Channel 1	PnP	ESC: Exit ↑ ↓ : Sel
DMA Channel 3	PnP	PgUp/PgDn: Modify
DMA Channel 5	PnP	F1: Help F2/F3: Color
DMA Channel 6	PnP	
DMA Channel 7	PnP	
IRQ3	PCI/PnP	
IRQ4	PCI/PnP	
IRQ5	PCI/PnP	
IRQ7	PCI/PnP	
IRQ9	PCI/PnP	
IRQ10	PCI/PnP	
IRQ11	PCI/PnP	
IRQ14	PCI/PnP	
IRQ15	PCI/PnP	

Figure 6: PCI / Plug and Play Setup

Plug and Play Aware O/S
If enable, BIOS will configure only PnP ISA boot devices (i.e. all PnP ISA cards which has boot flag set). And PnP aware OS will configure all other

devices. If disabled, BIOS will configure all devices.

Clear NVRAM on Every Boot
When this option is set to Yes, system can auto clear NVRAM.

PCI Latency Timer (PCI Clocks)
This option specifies the latency timings (in PCI clocks) for PCI devices installed in the PCI expansion slots. The settings are 32, 64, 96, 128, 160, 192, 224, or 248.

PCI VGA Palette Snoop
If enable, PCI will allow VGA palette signals to go to the ISA bus.

Allocate IRQ to PCI VGA
Set this option to Yes to allocate an IRQ to the VGA device on the PCI bus. The settings are Yes or No.

PCI Slot1/2/3/4 IRQ Priority
The option specifies the IRQ priority for PCI device installed in the PCI expansion slot. The settings are Auto, (IRQ) 3, 4, 5, 7, 9, 10, and 11, in priority order.

DMA Channel 0/1/3/5/6/7
The option allows you to specify the bus type used by each DMA channel. The settings are PnP or ISA/EISA.

IRQ3/4/5/7/9/10/11/14/15
The option specifies the bus that the specified IRQ line is used on. The option allows you to reserve IRQs for legacy ISA adapter cards. The option determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the pool, the end user can use the option to reserve the IRQ by assigning an ISA/EISA setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as PCI/PnP.

4.9 Peripheral Setup Selections

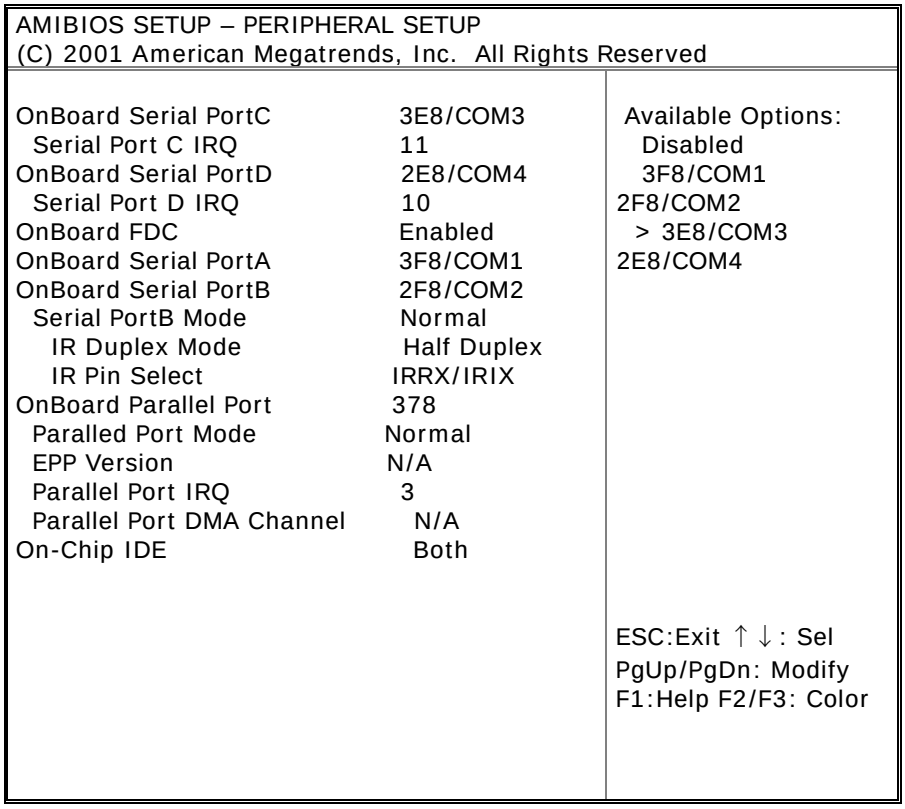


Figure 7: Peripheral Setup

OnBoard FDC
Set this option to Enabled to enable the floppy drive controller on the motherboard. The settings are Auto (AMIBIOS automatically determines if the floppy controller should be enabled), Enabled, or Disabled.

OnBoard Serial PortA/B
This option specifies the base I/O port address of serial port A. The settings are Auto (AMIBIOS automatically determines the correct base I/O port address), Disabled, 3F8h, 2F8h, 2E8h, or 3E8h.

OnBoard Parallel Port
This option specifies the base I/O port address of parallel port on the motherboard. The settings are Disabled, 378h, 278h, or 3BCh.

Parallel Port Mode
This option specifies the parallel port mode.
The settings are Normal, Bi-Dir, EPP, or ECP.
Normal: The normal parallel port mode is used.
Bi-Dir: Use this setting to support bi-directional transfers on the parallel port.
EPP: The parallel port can be used with devices that adhere to the Enhanced Parallel Port (EPP) specification. EPP uses the existing parallel port signals to provide asymmetric bi-directional data transfer driven by the host device.
ECP: The parallel port can be used with devices that adhere to the Extended Capabilities Port (ECP) specification. ECP uses the DMA protocol to achieve data transfer rates up to 2.5 Megabits per second. ECP provides symmetric bi-directional communication.

Parallel Port IRQ
This option specifies the IRQ used by the parallel port. The settings are Auto, (IRQ) 5, (IRQ) 7.

Parallel Port DMA Channel
This option is only available if the setting for the Parallel Port Mode option is ECP. This option sets the DMA channel used by the parallel port. The settings are DMA Channel 0, 1, or 3.

On-Chip IDE
This option specifies the IDE channel used by the onboard IDE controller
The settings are Disabled, Primary, and Secondary.

4.10 Hardware Monitor Setup Selections

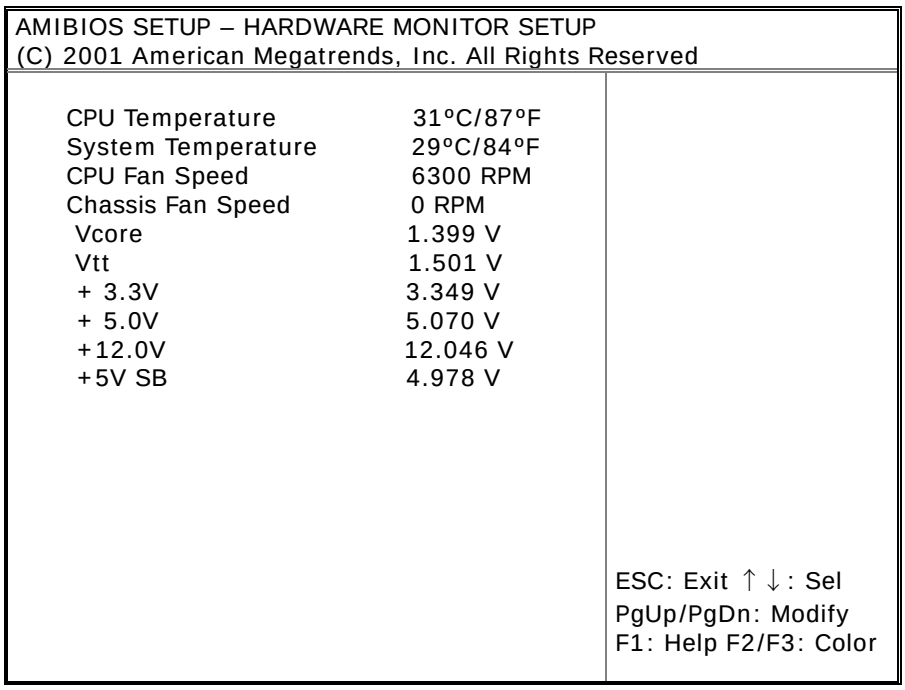

AMIBIOS SETUP – HARDWARE MONITOR SETUP
(C) 2001 American Megatrends, Inc. All Rights Reserved
CPU Temperature 31ºC/87ºF
System Temperature 29ºC/84ºF
CPU Fan Speed 6300 RPM
Chassis Fan Speed 0 RPM
Vcore 1.399 V
Vtt 1.501 V
+ 3.3V 3.349 V
+ 5.0V 5.070 V
+12.0V 12.046 V
+5V SB 4.978 V
ESC: Exit ↑ ↓: Sel
PgUp/PgDn: Modify
F1: Help F2/F3: Color

Figure 8: Hardware Monitor Setup

This setup helps users monitor NOVA-7820 board on board system voltage and fan speed. The function is implemented by on board W83627HF chip. The voltage monitoring will cover Vcore, Vtt, +3.3V, SB5V, +5V and +12V. And there is one fan connector for CPU fan.

Appendix A Watchdog Timer

Watchdog Timer is a device to ensure that standalone systems can always recover from catastrophic conditions that cause CPU crash which may be caused by external EMI or a software bug. When the CPU stops working normally, hardware on the board will issue a time-out signal.

A BIOS function call (INT 15H) is used to control Watchdog Timer:

INT 15H:

AH – 6FH
Sub-function: **AL – 2** : Set the Watchdog Timer's period **BL**: Time-out value(the time unit--second, is dependent on the item "Watchdog Timer unit (selected in BIOS setup).

You have to call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, Watchdog Timer will start counting down. When the timer value reaches zero, the system will reset. To ensure reset condition does not occur, Watchdog Timer must be periodically refreshed by calling sub-function 2. However the Watchdog timer will be disabled if you set the time-out value to be zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

Note: When exiting a program, it is necessary to disable Watchdog Timer, otherwise the system will reset.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

      MOV    AX, 6F02H          ;setting the time-out value
      MOV    BL, 30              ;time-out value is 48 seconds
      INT     15H
;
; ADD YOUR APPLICATION PROGRAM HERE
;
      CMP    EXIT_AP, 1         ;is your application over?
      JNE     W_LOOP            ;No, restart your application

       MOV   AX, 6F02H          ;disable Watchdog Timer
       MOV   BL, 0               ;
       INT    15H
;
; EXIT
```

Appendix B Digital I/O

One characteristic of digital circuit is its fast response to high or low signal. This kind of response is highly needed for harsh and critical industrial operating environment. That's why we design 4-bit digital inputs and 4-bit digital outputs on the NOVA-7820.
Digital Input and Output, generally, are control signals. You can use these signals to control external devices that needs On/Off circuit or TTL devices. You can read or write data to the selected address to enable the function of digital IO.

A BIOS function call (INT 15H) is used to control Watchdog Timer:

INT 15H:

AH – 6FH
Sub-function: **AL – 8**: Set the Digital port is INPUT **AL** : Digital I/O input value

Example program:

```
MOV    AX, 6F08H          ;setting the Digital port is input
INT    15H                  ;
```

AL low byte = value

AH – 6FH
Sub-function: **AL – 9**: Set the Digital port is OUTPUT **BL** : Digital I/O output value

Example program:

```
MOV    AX, 6F09H          ;setting the Digital port is output
MOV    BL, 09H            ;Digital value is 09H
INT    15H                  ;
```

Digital Output is 1001b

Appendix C Address Mapping

IO Address Map

I/O address Range	Description
000-01F	DMA Controller #1
020-021	Interrupt Controller #1, Master
02E-02F	Super I/O
040-05F	8254 timer
04E-04F	Super I/O
060-06F	8042 (Keyboard Controller)
070-07F	Real time Clock, NMI Mask
080-09F	DMA Page Register
0A0-0BF	Interrupt Controller #2
0C0-0DF	DMA Controller #2
0F0	Clear Math Coprocessor Busy
0F1	Reset Math Coprocessor
0F2	Core logic programming configuration
0F8-0FF	Math Coprocessor
1F0-1F8	Fixed Disk
295-296	Hardware Monitor
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
300-31F	Prototype Card
360-36F	Reserved
378-37F	Parallel Printer Port 1 (LPT2)
3B0-3BF	Monochrome Display and Printer Adapter (LPT1)
3C0-3CF	Reserved
3D0-3DF	Color/Graphics Monitor Adapter
3E8-3EF	Serial Port 3
3F0-3F7	Diskette Controller
3F8-3FF	Serial Port 1

1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
C0000-C7FFF	VGA BIOS
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	Available
IRQ2	Cascade to IRQ Controller	IRQ10	COM4
IRQ3	COM2	IRQ11	COM3
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	Audio Device	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Printer	IRQ15	Secondary IDE

DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Appendix D How to Use Wake-up Function

NOVA-7820 provides two kind of Wake up Function. This page describes how to use Modem Wake-Up and LAN Wake-Up function.
Wake-Up function is working while you use ATX power supply.

Wake-Up By Ring:
You must set the option ***Power On By Ring*** of CMOS SETUP to be enabled. The ATX power supply will be switched on when there is a ring signal detected on pin "RI" of serial port.

Wake-Up On LAN:
When your computer is in power-down status, you can see LAN Link/Active LED is flashing. This status indicates that the LAN chip has entered standby mode and waits for Wake-Up signal. You can use other computers to wake up your computer by sending ID to it.

ID: ID is the address of your system LAN. Every LAN chip has a factory, set ID, which you can find it from network information in WINDOWS.

The format of ID is xxxxxxxxxxxx
Example ID: 009027388320

Appendix E How to Use Video-in Function

NOVA-7820 provides users to capture live video from video source such as the CCTV camera. NOVA-7820 has four video input channels for surveillance systems.

Driver Installation:
Taking the advantage of IEI driver installation program makes the driver installation an easy job.

Steps:
1. Insert the IEI Driver CD (4).
2. The window will display the menu of IEI Driver CD. Click “IVC Series”.
3. Click “IVC-100/100G/200/200G”.
4. Double click the “Windows” folder.
5. Double click “ ieisetup.exe”.

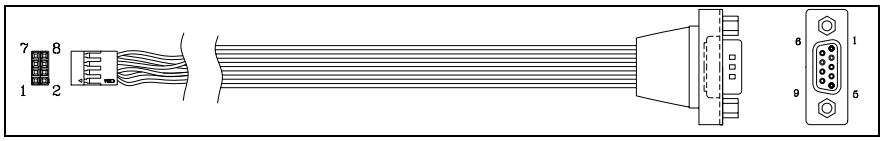
Microsoft Direct X 8.1 or above is need. The setup program (ieisetup.exe) will prompt you to install Direct X 8.1 after the driver installation has been completed. Therefore, IEI strongly recommends you to use ieisetup.exe for driver installation.

Demo Programs:

1. Double click “Demo” folder.
2. Double click “ivc-100.exe”.

Connection:

Connect cable 1: Dupont Head 8-pin, to CPU board.



Dupont Head 8-pin D-SUB 9-pin

Pin Definition:

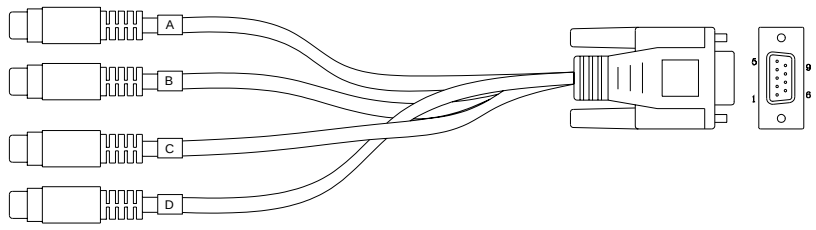
Dupont Head 8-pin

PIN	Description	PIN	Description
1	AVIN0	2	GROUND
3	AVIN1	4	GROUND
5	AVIN2	6	GROUND
7	AVIN3	8	GROUND

D-SUB 9-pin (for both cable 1 and cable 2)

PIN	Description	PIN	Description
1	AVIN0	2	AVIN1
3	AVIN2	4	AVIN3
5	N.C.	6	GROUND
7	GROUND	8	GROUND
9	GROUND		

Cable 2: D-SUB 9-pin, connected to cable 1.
RCA connectors are used to connect with video-in source.



RCA connector D-SUB 9-Pin

Appendix F How to Use LCD-TYPE Function

NOVA-7820 provides four kind of LCD-TYPE Function. This page describes how to use LCD-TYPE function.

LCD-TYPE function Procedure:

1. Go to the DOS command prompt in MS-DOS or Windows 9x.
2. At the DOS command prompt, type "LCD_Prg".
3. Then you can set 1,2,3,4 from LCD Type.

ICP Electronic Inc. LCD Module Flash Utility
640x480 18 bits 800x600 18 bits 1024x768 18 bits 1024x768 36 bits
[M]Menu [1-4] LCD Type [ESC]Exit

4. Reboot the system.